

C L A I M S

1. A mobile communication system which comprises a radio network controller and a radio base station connected to said
5 radio network controller and which provides a mobile communication service to a mobile terminal connectable to said radio base station, wherein

said radio base station is installed within a private network,

10 a relay node installed in said private network relays mobile communication traffic transmitted on said private network between said radio network controller and said radio base station, and

when said mobile terminal makes or receives a call, said
15 relay node performs reception determination processing in cooperation with bandwidth management function in said private network and provides a communication line to said mobile terminal when permitting the reception.

2. The mobile communication system according to claim 1,
20 wherein said relay node receives a bandwidth control signaling that said radio network controller transmits to said radio base station when said mobile terminal makes or receives a call to thereby start the reception determination processing.

3. The mobile communication system according to claim 1,
25 wherein said relay node is a VPN gateway.

4. A mobile communication system which comprises a radio network controller and a radio base station connected to said radio network controller and which provides a mobile communication service to a mobile terminal connectable to said

radio base station, wherein

said radio base station is installed within a private network,

a relay node installed in said private network relays
5 mobile communication traffic transmitted on said private network between said radio network controller and said radio base station,

first and second encryption keys are used, respectively, between said radio network controller and relay node and
10 between said radio base station and relay node to perform encrypted communication, and

a pre-shared key needed to generate said second encryption key is dynamically generated by a key exchange mechanism between said radio network controller and radio base
15 station, said generated pre-shared key being notified from said radio network controller to said relay node.

5. A mobile communication system which comprises a radio network controller and a radio base station connected to said radio network controller and which provides a mobile
20 communication service to a mobile terminal connectable to said radio base station, wherein

said radio base station is installed within a private network,

mobile communication traffic between a relay node which
25 is connected to said radio base station via said private network and said radio base station is transmitted on said private network,

said relay node relays the mobile communication traffic transmitted on said private network between said radio network

controller and said radio base station,

first and second encryption keys are used, respectively,
between said radio network controller and relay node and
between said radio base station and relay node to perform
5 encrypted communication, and

said second encryption key is dynamically generated by a
key exchange mechanism between said radio network controller
and said radio base station, the generated second encryption
key being notified from said radio network controller to said
10 relay node.

6. The mobile communication system according to claim 4,
wherein

said radio network controller comprises means for
dynamically generating said pre-shared key by using a key
15 exchange mechanism between itself and said radio base station,
and means for notifying said relay node of said generated pre-
shared key.

7. The mobile communication system according to claim 5,
wherein

20 said radio network controller comprises means for
dynamically generating said second encryption key by using a
key exchange mechanism between itself and said radio base
station, and means for notifying said relay node of said
generated second encryption key.

25 8. A relay node which relays mobile communication traffic
between a radio base station and a radio network controller,
wherein

said relay node is installed in a private network in
which said radio base station is installed and relays mobile

communication traffic transmitted on said private network between said radio network controller and said radio base station,

said relay node comprising:

5 means for receiving a bandwidth control signaling that said radio network controller transmits to said radio base station;

means for extracting traffic information comprises in the bandwidth control signaling;

10 means for performing reception determination in cooperation with a bandwidth management mechanism within said private network; and

means for transmitting the bandwidth control signaling including a result of the reception determination and
15 bandwidth control information whose reception has been permitted.

9. A relay node which relays mobile communication traffic between a radio base station and a radio network controller, wherein

20 said relay node is installed in a private network in which said radio base station is installed and relays mobile communication traffic transmitted on said private network between said radio network controller and said radio base station, and

25 said relay node is connected to said radio base station and radio network controller and performs encrypted communication with said radio network controller by using a first encryption key and with said radio base station by using a second encryption key,

said relay node comprising:

means for receiving a pre-shared key for generating the second encryption key from said radio network controller;

means for dynamically generating said second encryption
5 key between itself and said radio base station by using said pre-shared key; and

means for encrypting the mobile communication traffic by using said second encryption key.

10 10. A relay node which relays mobile communication traffic between a radio base station and a radio network controller, wherein

said relay node is installed in a private network in which said radio base station is installed and relays mobile communication traffic transmitted on said private network
15 between said radio network controller and said radio base station, and

said relay node is connected to said radio base station and radio network controller and performs encrypted communication with said radio network controller by using a
20 first encryption key and with said radio base station by using a second encryption key,

said relay node comprising:

means for receiving said second encryption key from said radio network controller; and

25 means for encrypting the mobile communication traffic by using said second encryption key.

11. A radio network controller connected to a plurality of radio base stations via a relay node which performs encrypted communication with said radio base stations by using

different encryption keys, said radio network controller comprising:

means for dynamically generating a pre-shared key needed to generate said encryption key between itself and said radio
5 base station by using a key exchange mechanism; and

means for notifying said relay node of the generated pre-shared key.

12. A radio network controller connected to a plurality of radio base stations via a relay node which performs
10 encrypted communication with said radio base stations by using different encryption keys, said radio network controller comprising:

means for dynamically generating said encryption key between itself and said radio base stations by using a key
15 exchange mechanism; and

means for notifying said relay node of the generated encryption key.

13. A relay node program allowing a computer serving as a relay node which relays mobile communication traffic between a
20 radio base station and radio network controller to execute a function of relaying mobile communication traffic transmitted on a private network between the radio network controller and radio base station, said computer serving as a relay node and radio base station being installed within said private network,

25 said program further allowing the computer to execute functions of: receiving a bandwidth control signaling that said radio network controller transmits to said radio base station: extracting traffic information comprises in the bandwidth control signaling; performing reception

determination in cooperation with a bandwidth management mechanism within said private network; and transmitting the bandwidth control signaling including a result of the reception determination and bandwidth control information
5 whose reception has been permitted.

14. A relay node program allowing a computer serving as a relay node which relays mobile communication traffic between a radio base station and radio network controller to execute a function of relaying mobile communication traffic transmitted
10 on a private network between said radio network controller and radio base station, and to perform encrypted communication with said radio network controller by using a first encryption key and with said radio base station by using a second encryption key, said computer serving as a relay node and
15 radio base station being installed within said private network,
said program further allowing the computer to execute functions of: receiving a pre-shared key for generating said second encryption key from said radio network controller; dynamically generating said second encryption key between
20 itself and said radio base station by using said pre-shared key; and encrypting the mobile communication traffic by using said second encryption key.

15. A relay node program allowing a computer serving as a relay node which relays mobile communication traffic between a
25 radio base station and radio network controller to execute a function of relaying mobile communication traffic transmitted on a private network between said radio network controller and radio base station, and to perform encrypted communication with said radio network controller by using a first encryption

key and with said radio base station by using a second encryption key, said computer serving as a relay node and radio base station being installed within said private network,

5 said program further allowing the computer to execute functions of: receiving said second encryption key from said radio network controller; and encrypting the mobile communication traffic by using said second encryption key.

16. A radio network controller program allowing a computer serving as a radio network controller connected to a plurality of radio base stations via a relay node which performs encrypted communication with said radio base stations by using different encryption keys to execute functions of: dynamically generating a pre-shared key needed to generate said encryption key between itself and said radio base station
10 by using a key exchange mechanism; and notifying said relay node of the generated pre-shared key.
15

17. A radio network controller program allowing a computer serving as a radio network controller connected to a plurality of radio base stations via a relay node which performs encrypted communication with said radio base stations by using different encryption keys to execute functions of: dynamically generating said encryption key between itself and said radio base station by using a key exchange mechanism; and notifying said relay node of the generated encryption key.
20

25 18. A mobile communication method for use in a mobile communication system which comprises a radio network controller and a radio base station connected to said radio network controller and which provides a mobile communication service to a mobile terminal connectable to said radio base

station, wherein

said radio base station and relay node are installed within a private network comprised said the mobile communication system,

5 said relay node relays mobile communication traffic transmitted on said private network between said radio network controller and radio base station, and

when said mobile terminal makes or receives a call, said relay node performs reception determination processing in
10 cooperation with bandwidth control in the private network and provides a communication line to said mobile terminal when permitting the reception.

19. A mobile communication method for use in a mobile communication system which comprises a radio network
15 controller and a radio base station connected to said radio network controller and which provides a mobile communication service to a mobile terminal connectable to said radio base station, wherein

said radio base station and relay node are installed
20 within a private network comprised in said mobile communication system,

a relay node relays mobile communication traffic transmitted on said private network between said radio network controller and radio base station,

25 first and second encryption keys are used, respectively, between said radio network controller and relay node and between said radio base station and relay node to perform encrypted communication, and

a pre-shared key needed to generate said second

encryption key is generated by a key exchange mechanism between said radio network controller and radio base station, the generated pre-shared key being notified from said radio network controller to said relay node.

5 20. A mobile communication method for use in a mobile communication system which comprises a radio network controller and a radio base station connected to said radio network controller and which provides a mobile communication service to a mobile terminal connectable to said radio base
10 station, wherein

 said radio base station is installed within a private network and is connected to a relay node via said private network in said mobile communication system,

 mobile communication traffic between said relay node and
15 radio base station is transmitted on said private network,

 said relay node relays the mobile communication traffic transmitted on said private network between said radio network controller and radio base station,

 first and second encryption keys are used, respectively,
20 between said radio network controller and relay node and between said radio base station and relay node to perform encrypted communication, and

 said second encryption key is dynamically generated by a key exchange mechanism between said radio network controller
25 and radio base station, the generated second encryption key being notified from said radio network controller to said relay node.